

REMARKS

This is a full and timely response to the outstanding final Office Action mailed October 6, 2004. Upon entry of the amendments in this response, claims 20 - 24 remain pending. In particular, Applicant has amended claim 20. Reconsideration and allowance of the application and presently pending claims are respectfully requested.

In the Specification

As set forth above, Applicant has amended the specification to add the reference character “8d” in the description in compliance with 37 CFR 1.121(b). The typographical error that improperly identified “via hole 7a” also has been amended as “via hole 6b”. Applicant respectfully asserts that the changes to the specification are fully supported by the original disclosure and, as such, it is respectfully asserted that no new matter has been added.

In the Drawings

In the attached replacement sheet of drawings, Applicant has added a reference character “8d” in Fig. 7B to identify the boundary of the metal interconnect component. Applicant respectfully asserts that the changes to the drawings are fully supported by the original disclosure and, as such, it is respectfully asserted that no new matter has been added.

Rejections under 35 U.S.C. §102

The Office Action indicates that Claims 20 stands rejected under 35 U.S.C. 102(b) as being anticipated by *Harada* (U.S. 5,341,026). Applicant respectfully traverses the rejection.

In this regard, *Harada* discloses that a titanium film compound layer 102 formed on the titanium layer 101 prevents reaction of the titanium layer 101 with an upper layer 103. (*Harada*, col. 3, lines 53-56). Note that layer 103 contains aluminum. Therefore, it is clear that *Harada*'s metal interconnect structure is not made of a single material.

Turning now to claim 20, that claim has been amended to recite:

20. An interconnect structure on a semiconductor substrate, comprising:
a via hole in a insulator layer exposing a portion of an underlying lower level metal interconnect structure;
a recessed metal plug structure located in a bottom portion of said via hole, with said recessed metal plug structure overlying and contacting the portion of said lower level metal interconnect structure exposed in said via hole; and
a metal interconnect structure made of a single material layer, the metal interconnect structure comprising:
a metal ring component completely located in a top portion of said via hole, contacting the top surface of said recessed metal plug structure, with said metal ring component continually decreasing in thickness from each side to a center of said via hole; and
a metal interconnect component with a first portion thereof located on a first portion of a smooth top surface of said insulator layer and a second portion thereof, on said via hole, contacting a top surface of said metal ring component;
wherein said second portion of said metal interconnect component extends over only part of the via hole.

(*Emphasis added*).

Applicant respectfully asserts that *Harada* is legally deficient for the purpose of anticipating claim 20. Specifically, Applicant respectfully asserts that *Harada* does not teach or otherwise disclose at least the features/limitation emphasized above in claim 20. Therefore, Applicant respectfully asserts that claim 20 is in condition for allowance.

Rejections under 35 U.S.C. §103

The Office Action indicates that claims 21 - 24 stand rejected under 35 U.S.C. 103(a) as being anticipated by *Harada*. Applicant respectfully traverses the rejection. Specifically, Applicant respectfully asserts that Harada does not teach or reasonably suggest at least the features/limitations indicated above as lacking with respect to independent claim 20. Since claims 21 – 24 are dependent claims that incorporate all the features/limitations of claim 20, Applicant respectfully asserts that these claims are not properly rejected. Therefore, Applicant respectfully requests that these claims be placed in condition for allowance.

Cited Art Made of Record

The cited art made of record has been considered, but is not believed to affect the patentability of the presently pending claims.

CONCLUSION

In light of the foregoing amendments and for at least the reasons set forth above, Applicant respectfully submits that all objections and/or rejections have been traversed, rendered moot, and/or accommodated, and that the now pending claims 20 – 24 are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (770) 933-9500.

No fee is believed to be due in connection with this amendment and response to Office Action. If, however, any fee is believed to be due, you are hereby authorized to charge any such fee to deposit account No. 20-0778.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Daniel R. McClure", written over a horizontal line.

Daniel R. McClure, Reg. No. 38,962

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In the Drawings

The attached sheet of drawings includes changes to Fig. 7B. This sheet replaces the previously submitted sheet.